CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME III

Editors:

Md. Zahangir Alam
Ahmed Tariq Jameel
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IIUM PRESS

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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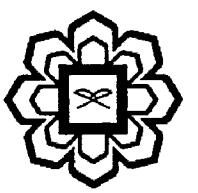
Department of Biotechnology Engineering
Faculty of Engineering
International Islamic University Malaysia



IIUM Press

Published by:
IIUM Press
International Islamic University Malaysia

First Edition, 2011

Perpustakaan Negara Malaysia Cataloguing-in-Publication Data

Md. Zahangir Alam, Ahmed Tariq Jameel & Azura Amid: Current Reasearch and Development in Biotechnology Engineering at IIUM Volume III

ISBN: 978-967-418-144-4

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Printed by :
IIUM PRINTING SDN. BHD.
No. 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan

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CHAPTER 19

FOWL CHOLERA VACCINE PRODUCTION: PROCESS OPTIMIZATION IN LABORATORY SCALE FERMENTER

Maizirwan Mel[1], Mohd Ismail Abdul Karim[1], Nor Jannah Yob[1], Intan Zahrah Samsury[1], Sharifah Syed Hassan[2] and Akma Ngah Hamid[2]

[1] Department of Biotechnology Engineering, Faculty of Engineering, International Islamic University Malaysia, P.O. Box 10, 50728 Kuala Lumpur, Malaysia
[2]Veterinary Research Institute, 59 Jalan Sultan Azlan Shah, 31400 Ipoh

ABSTRACT

The process optimization of *Pasteurella multocida* fermentation for fowl cholera vaccine production in 2L laboratory scale fermenter was successfully carried out in stirred tank reactor (STR). This study focuses on the maximizing the cell growth and protein production of *P. multocida* by optimizing process of various fermentation condition. The process optimization was designed for different level of parameters that were dissolved oxygen concentration (pO_2), stirrer speed (rpm) and pH using Taguchi's Experimental Robust Design by STATISTICA 6.0 software. From the result obtained, the yield of biomass was significantly affected by higher agitation (200 rpm) and for antigen protein production was significantly affected by lower pO_2 level (1 vvm). The correlation between the parameters was very affecting the productivity of the vaccine produced.

Keywords *Fowl Cholera, vaccine, optimization, and fermenter*

INTRODUCTION

According to the livestock statistics in 1999 (DVS, 2003), the total population of rural chickens in the country is 90 million birds. With a projected 10 % increase per year estimated population in 2006 would be more 150 million. Assuming only 50 % of the birds are vaccinated and for optimum protection, it is recommended to vaccine 2 doses for broiler and 3 doses for layers and breeders. Therefore, more than 300 million doses of fowl cholera will be needed. Currently, Veterinary Research Institute is the only placed that produce fowl cholera vaccine by utilizing cumbersome method. According to the statistic given by VRI, they only can manage the vaccine production around 2 million doses per year, thus to overcome the shortage, vaccine were imported from others country. This shortage of vaccine has created the need of Fowl Cholera vaccine to be produced from local strain in order to reduce further economic losses to the poultry